

# Cyclosporiasis (*Cyclospora spp.*)

March 2004 HighPoint

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## 1) THE DISEASE AND ITS EPIDEMIOLOGY

### A. Etiologic Agent

This disease is caused by *Cyclospora cayetanensis*, a coccidian protozoan parasite. Humans with cyclosporiasis shed the parasite in a non-infectious form that takes from several days to a couple of weeks to mature into its infectious form. The time required for maturation to the infectious form depends on factors such as temperature and moisture (*in vitro* sporulation at 27 to 32C takes from 8 to 11 days).

### B. Clinical Description and Laboratory Diagnosis

This parasite infects the small intestine and typically causes watery diarrhea. Other symptoms can include nausea, vomiting, abdominal cramping, gas, bloating, fatigue and loss of appetite and weight. Occasionally, infected individuals in disease-endemic areas may not have any symptoms. Untreated, symptoms may last from several days to several weeks (longer in immunocompromised individuals), and weight loss can be significant (exceeding 20 pounds in some cases). Infection is usually self-limited, and relapse of symptoms is common in untreated persons.

Laboratory diagnosis is based on microscopic identification of oocysts in stool, duodenal aspirates or small bowel biopsy specimens. Molecular diagnostic methods based on PCR are used by some laboratories and may cross react with *Eimeria sp.* – non-human pathogen.

### C. Reservoirs

Humans are the only known reservoir for *C. cayetanensis*.

### D. Modes of Transmission

Direct human-to-human transmission has not been documented, probably because excreted oocysts take days to weeks under certain environmental conditions to sporulate and become infectious. Humans become infected by consuming food or water that has been contaminated with human feces containing *Cyclospora*. Outbreaks in the United States have been associated with imported raspberries and with other fresh produce. Agricultural water used for spraying may contaminate berries, and their delicate surfaces make cleaning difficult.

### E. Incubation Period

The average incubation period is 1 week, with a range of 1-14 days.

### F. Period of Communicability or Infectious Period

People may shed *Cyclospora* parasites for days to over one month while actively ill. It is not known how long the parasite may be shed after symptoms have stopped.

### G. Epidemiology

Cyclosporiasis was first recognized in 1979. The parasite is found throughout the world and is endemic in countries such as Nepal, Peru, and Haiti. Cyclosporiasis has frequently been reported as a cause of traveler's diarrhea. Most cases occur during the warmer months. The largest documented outbreaks of cyclosporiasis in the United States occurred during the summers of 1996 and 1997; a majority of those cases were associated with imported raspberries.

## 2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

### A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition

#### CASE CLASSIFICATION:

##### A. CONFIRMED

- Demonstration of *Cyclospora* oocysts in stool, duodenal/jejunal aspirates, or small bowel biopsies; **OR**
- Demonstration of *Cyclospora* DNA in stool, duodenal/jejunal aspirates, or small bowel biopsies.

##### B. PROBABLE

A clinically compatible case, which is epidemiologically linked to a confirmed case by the NJDHSS.

##### C. POSSIBLE

Not used.

### B. Laboratory Testing Services Available

The Public Health and Environmental Laboratories (PHEL) provide testing for *Cyclospora* on formalinized fecal material using an acid-fast stain to identify the presence of oocysts.

## 3) DISEASE REPORTING AND CASE INVESTIGATION

### A. Purpose of Surveillance and Reporting

- To identify transmission sources of public health concern (*e.g.*, contaminated food or water) and to stop transmission from such sources.
- To provide education about reducing risk of infection.

### B. Laboratory and Healthcare Provider Reporting Requirements

N.J.A.C. 8:57-1.8 stipulates that laboratories and health care providers report (by telephone, confidential fax, over the Internet using the Communicable Disease Reporting System [CDRS] or in writing) all cases of cyclosporiasis to the local health officer having jurisdiction over the locality in which the patient lives, or, if unknown, to the health officer in whose jurisdiction the health care provider requesting the laboratory examination is located.

### C. Local Health Departments Reporting and Follow-Up Responsibilities

#### 1. Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that each local health officer must report the occurrence of any case of cyclosporiasis, as defined by the reporting criteria in Section 2 A above to the NJDHSS Infectious and Zoonotic Diseases Program (IZDP). Current requirements are that cases be reported to the NJDHSS IZDP using the [CDS-1 form](#). A report can also be filed electronically over the Internet using the confidential and secure CDRS.

#### 2. Case Investigation

- a. It is the local health officer's responsibility to complete the [CDS-1](#) reporting form by interviewing the patient and others who may be able to provide pertinent information. Much of the information on the form can be obtained from the patient's healthcare provider or the medical record.
- b. Use the following guidelines to complete the form:

- 1) Accurately record the case-patient's demographic information, date of symptoms onset, symptoms, and medical information.
- 2) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for cyclosporiasis (1–14 days). Specifically, focus on the period beginning a minimum of 1 day prior to the case-patient's onset date back to no more than 14 days before onset.
- 3) If possible, record any restaurants or social gatherings at which the case-patient ate, including food item(s) and date consumed.
- 4) Ask questions about travel history and outdoor activities, particularly recreational swimming, boating and water park visits.
- 5) Ask about drinking water supply, because cyclosporiasis may be acquired through water consumption.
- 6) Ask about household/close contact, pet or other animal contact.
- 7) If there have been several attempts to obtain patient information (*e.g.*, the patient or healthcare provider does not return calls or does not respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely.
- 8) **If CDRS is used to report, enter collected information into the “Comments” section.**

After completing the form, it should be mailed (in an envelope marked “Confidential”) to the NJDHSS IZDP, or the report can be filed electronically using the CDRS.

The mailing address is:

NJDHSS  
Division of Epidemiology, Environmental and Occupational Health  
Infectious and Zoonotic Diseases Program  
P.O.Box 369  
Trenton, NJ 08625-0369

- c. Institution of disease control measures is an integral part of case investigation. It is the local health officer's responsibility to understand, and, if necessary, to institute the control guidelines listed below in Section 4, “Controlling Further Spread.”

## 4) CONTROLLING FURTHER SPREAD

### A. Isolation and Quarantine Requirements (N.J.A.C. 8:57-1.12)

#### Minimum Period of Isolation of Patient

No restrictions.

#### Minimum Period of Isolation of Contacts

No restrictions

### B. Protection of Contacts of a Case

None.

### C. Managing Special Situations

#### Daycare Centers and Schools

As noted in Section 1D of this chapter, current knowledge of human cyclosporiasis suggests that it is **not** transmitted directly from person-to-person. After being shed in human stool, the parasite must undergo developmental changes (taking days to weeks) before becoming infectious. Humans become infected by

consuming food or water that has been contaminated with human feces containing *Cyclospora*. There are no specific recommendations for daycare or school situations as found in the other enteric disease chapters (e.g., salmonellosis, shigellosis, etc.). See the next section if there is a cluster of cases identified at a school or daycare that may be associated with a contaminated food item.

#### **Reported Incidence Is Higher than Usual/Outbreak Suspected**

If the number of reported cases of cyclosporiasis in a city/town is higher than usual, or if an outbreak is suspected, investigate to determine the source of infection and mode of transmission. A common vehicle, such as water or food, should be sought and applicable preventive or control measures should be instituted (e.g., removing an implicated food item from the environment). Consult with the NJDHSS IZDP. The IZDP staff can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several jurisdictions and therefore be difficult to identify at a local level.

### **D. Preventive Measures**

#### **Personal Preventive Measures/Education**

To avoid infection with *Cyclospora*, recommend that individuals:

- Avoid drinking unboiled or untreated water when hiking, traveling in developing countries or wherever the water quality is unknown. Bringing water to a full, rolling boil is sufficient to kill *Cyclospora*.
- Thoroughly wash all fresh fruits and vegetables prior to consumption. This precaution, however, may not entirely eliminate the risk of transmission.

*Note:* For more information regarding international travel contact the Centers for Disease Control and Prevention (CDC), Traveler's Health Office at (877) 394-8747 or through the Internet at <http://www.cdc.gov/travel>.

## **ADDITIONAL INFORMATION**

A [Cyclosporiasis](http://www.state.nj.us/health) Fact Sheet can be obtained at the NJDHSS website at <http://www.state.nj.us/health>.

The formal CDC surveillance case definition for *Cyclospora* is the same as the criteria outlined in Section 2 A of this chapter. CDC case definitions are used by the state health department and CDC to maintain uniform standards for national reporting. When reporting a case to the NJDHSS, always refer to the reporting criteria in Section 2 A.

## **REFERENCES**

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Soave, Rosemary. Cyclospora: An Overview. Clinical Infectious Diseases, 1996; 23:429-37.